

**BY ORDER OF THE SECRETARY  
OF THE AIR FORCE**

**AIR FORCE POLICY DIRECTIVE 16-10**

**23 JANUARY 2015**

**Operations Support**

**MODELING AND SIMULATION**



**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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This Directive establishes policy for Air Force Modeling and Simulation (M&S). This publication reflects policy from Department of Defense (DoD) Directive (DoDD) 5000.59, *DoD M&S Management*, and reflects guidance from DoD Instruction (DoDI) 5000.61, *DoD M&S Verification, Validation, and Accreditation (VV&A)* and DoDI 5000.70, *Management of DoD M&S Activities* and applies to all AF organizations including the Air National Guard and Air Force Reserve Command.

Send all recommendations for changes or comments to M&S/Live, Virtual and Constructive (LVC) Division (AF/A3OL) workflow ([usaf.pentagon.af-a3.mbx.a3ol-workflow@mail.mil](mailto:usaf.pentagon.af-a3.mbx.a3ol-workflow@mail.mil)) or 1480 AF Pentagon, Washington, DC 20330-1480, through appropriate channels using AF Form 847, *Recommendation for Change of Publication*. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located in the Air Force Records Information Management System (AFRIMS), or any updated statement provided by the AF Records Management office.

**SUMMARY OF CHANGES**

This document has been substantially revised and must be completely reviewed. This directive reflects a complete reorganization of AF M&S.

**1. Overview:** Models and Simulations are representations of reality that allow Airmen to better understand and interact with their environment. M&S takes a variety of forms to include: equations, computer programs, scaled physical representations, simulators and more. M&S is

enhanced by various elements including; computer hardware and operating systems, networks, skilled personnel, techniques, processes, and services. To this end, M&S improves decision support for acquisition and analysis and enhances warfighting training and readiness. While an organization's internally designed/modified M&S and data used for issues within units, at or below Wing level, should adhere to best practices, they are not subject to this policy.

## **2. Policy.**

2.1. The AF must build, enhance and expand M&S capabilities to acquire, improve and sustain warfighting capabilities and provide decision quality information. The AF shall identify M&S best practices and promote appropriate standards and protocols to facilitate interoperability and suitable use/reuse across AF Organizations.

2.2. The AF will develop and use M&S capabilities to provide sufficiently realistic training, mission rehearsal and test validation with the goal of providing appropriate capacity, capability, concurrency, connectivity, and fidelity.

2.2.1. Environments. The AF will establish persistent, agile, trustworthy, robust, manageable, organized and integrated Live, Virtual, and Constructive (LVC) environments and ensure these environments are of sufficient fidelity to accurately support and augment LVC uses across the AF and any interactions with Joint, Interagency or Coalition systems. The AF is designated as the Air and Space Natural Environment M&S Executive Agent (ASNE MSEA), reference DoDD 5101.1, *DoD Executive Agent*, and DoDD 5000.59, *DoD Modeling and Simulation (M&S) Management*.

2.2.2. Architectures. The AF shall establish integrated, interoperable, and effective M&S architectures and strive to make these consistent with Joint, Interagency and Coalition systems.

2.3. The AF will develop and use Decision Support M&S capabilities, at the appropriate level of fidelity, to examine problems and provide decision-makers with usable information to reduce uncertainty associated with decisions.

2.4. Within the context of available resources/requirements, the AF shall develop, manage, and provide AF representative data, to support DoD M&S databases.

2.5. Within the context of DoD available resources/requirements, the AF shall develop and maintain metadata, as appropriate, to be used throughout the DoD community.

2.6. The AF will establish Verification, Validation, and Accreditation (VV&A) instructions relevant to M&S usage.

## **3. Roles and Responsibilities.**

3.1. AF M&S is aligned under three pillars: (1) Live, Virtual, and Constructive for Operational Training (LVC-OT) led by Deputy Chief of Staff for Operations (AF/A3), (2) Integrated Life Cycle Management (ILCM) led by Assistant Secretary of the Air Force for Acquisition (SAF/AQ), and (3) Decision Support led by Director, Studies & Analyses, Assessments, and Lessons Learned (AF/A9). Where differences exist within the pillars, pillar leads are responsible for developing necessary guidance, processes, and procedures to ensure compliance with this policy.

3.2. Deputy Chief of Staff for Operations (AF/A3):

3.2.1. Shall, in coordination with SAF/AQ and AF/A9, write and maintain overarching AF M&S policy and guidance and coordinate DoD and Joint Staff M&S issuances as lead AF M&S policy/guidance coordinator.

3.2.2. Develops LVC-OT Policy, acts as the Lead Integrator for LVC and serves as the lead for centrally managed oversight of LVC efforts across Major Commands (MAJCOM).

3.2.3. Collaborates with other Headquarters Air Force (HAF) organizations and MAJCOMs, Office of the Secretary of Defense (OSD), Joint Staff, and other DoD components/organizations, along with industry and academia, to advocate, implement, and enforce LVC standards and practices and ensure simulation capabilities are shared, classification issues are decided, and general issues with M&S for Operational Training are resolved in a cost effective manner.

3.2.4. The Director of Weather (AF/A3W), under the authority, direction and control of the AF/A3, is designated as the ASNE MSEA on behalf of the Air Force.

3.3. Assistant Secretary of the Air Force for Acquisition (SAF/AQ):

3.3.1. Develops policy and provides guidance and oversight for Air Force M&S policy and implementation for ILCM processes IAW AFPD 63-1/20-1, *Integrated Life Cycle Management* and Air Force Instruction (AFI) 63-101/20-101, *Integrated Life Cycle Management*.

3.3.2. Is responsible for acquisition lifecycle management resources, policy and guidance affecting development of M&S capabilities falling under the LVC-OT and Decision Support pillars.

3.4. Director, Studies, Analyses & Assessments (AF/A9):

3.4.1. Shall establish guidance and governance for Decision Support tools and methodologies.

3.4.2. Serves as the AF representative to the OSD M&S Steering Committee (SC) and works with the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics (OUSD (AT&L)) M&S Coordination Office.

3.5. HAF Staff, MAJCOMs, Field Operating Agencies (FOAs), and Direct Reporting Units (DRUs) shall identify and develop functional M&S requirements and capabilities within their core functional areas, missions, and assigned units. MAJCOM and DRU Commanders retain their authority to prioritize requirements and manage their resources.

DEBORAH LEE JAMES  
Secretary of the Air Force

**Attachment 1****GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

DoDD 5000.59, *DoD Modeling and Simulation (M&S) Management*, 8 August 2007

DoDD 5101.1, *DoD Executive Agent*, 3 September 2002

DoDI 5000.61, *DoD Modeling and Simulation (M&S) Verification, Validation, and Accreditation (VV&A)*, 9 December 2009

DoDI 5000.70, *Management of DoD Modeling and Simulation Activities*, 10 May 2012, Change 1, 19 March 2014

AFPD 63-1/20-1, *Integrated Life Cycle Management*, 3 July 2012

AFI 63-101/20-101, *Integrated Life Cycle Management*, 7 March 2013

AFMAN 33-363, *Management of Records*, 1 March 2008

*Department of Defense Discovery Metadata Specification (DDMS)*,  
<http://metadata.ces.mil/dse/irs/DDMS/>

*DoD M&S Glossary* (<http://www.msco.mil/MSGlossary.html>)

*Air Force Records Information Management System (AFRIMS)*,  
<https://www.my.af.mil/afrims/afrims/afrims/rims.cfm>

***Adopted Forms***

AF Form 847, *Recommendation for Change of Publication*

***Abbreviations and Acronyms***

**AF**—Air Force

**AFI**—Air Force Instruction

**AFMAN**—Air Force Manual

**AFPD**—Air Force Policy Directive

**AFRIMS**—Air Force Records Information Management System

**ASNE**—Air and Space Natural Environment

**C2**—Command and Control

**DoD**—Department of Defense

**DoDD**—Department of Defense Directive

**DoDI**—Department of Defense Instruction

**DRU**—Direct Reporting Unit

**FOA**—Field Operating Agency

**HAF**—Headquarters Air Force

**ILCM**—Integrated Life Cycle Management

**LVC**—Live, Virtual and Constructive

**LVC**—OT – Live, Virtual and Constructive-Operational Training

**M&S**—Modeling and Simulation

**MAJCOM**—Major Command

**MSEA**—Modeling and Simulation Executive Agent

**OPR**—Office of Primary Responsibility

**OSD**—Office of the Secretary of Defense

**OUSD (AT&L)**—Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics

**RDS**—Records Disposition Schedule

**SC**—Steering Committee

**VV&A**—Verification, Validation, and Accreditation

### *Terms*

*The following terms and their definitions are for the purposes of this document. Where no citation appears, the term has been derived from several sources or from common usage. Terms contained in this document and not defined in the DoD M&S Glossary (<http://www.msco.mil/MSGlossary.html>) are specified below.*—**Acquisition** – The conceptualization, initiation, design, development, test, contracting, production, deployment, and disposal of a directed and funded effort that provides a new, improved, or continued materiel, weapon, information system, logistics support, or service capability in response to an approved need. (AFPAM 63-128)

**Decision Support**— The process of gathering, generating, filtering, optimizing, and organizing mined information to support leadership decision making.

**Integrated Life Cycle Management (ILCM)**— The seamless governance, transparency, and integration of all aspects of infrastructure, resource management, and business systems necessary for successful development, acquisition, test and evaluation, fielding, sustainment, and disposal of systems, subsystems, end items, and services to satisfy validated warfighter capability needs.

**Live, Virtual, and Constructive— Operational Training (LVC-OT) Simulation** - A mixture of live operations, virtual simulation, and constructive modeling to provide training, test and mission rehearsal.

**Modeling & Simulation (M&S)**— The use of models, including emulators, prototypes, simulators, and stimulators, either statically or over time to develop data for the purposes of decision support for acquisition and analysis or to enhance training and increase warfighter readiness. The terms “modeling” and “simulation” are often used interchangeably. Note: unless otherwise specified in this or subordinate publications, this AF definition is used as it includes broader aspects of M&S than the DoD definition such as LVC-OT and mission rehearsal.

**Requirement**— An established need justifying the timely allocation of resources to achieve a capability to accomplish approved military objectives, missions, or tasks.

**Standard**— A rule, principle, or measurement established by authority, custom, or general consent as a representation or example.

**Trustworthy**— Deserving of confidence; consistent, dependable or reliable.